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Wach

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(54) **OPTICAL NETWORKING ASSEMBLY**

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(52) **U.S. Cl.** **385/39; 359/128; 385/16; 385/18; 385/24**

(58) **Field of Search** **385/15-24, 39, 385/47, 48; 359/124, 127, 128**

(56) **References Cited**

U.S. PATENT DOCUMENTS

4,693,544	A	9/1987	Yamasaki et al.	385/47
5,521,733	A	5/1996	Akiyama et al.	359/127
5,974,207	A	* 10/1999	Aksyuk et al.	385/24
6,219,474	B1	* 4/2001	Cai et al.	385/24

FOREIGN PATENT DOCUMENTS

EP	EP 0 611 097	8/1994
JP	JP 10 327128	12/1998
WO	WO 97/06616	2/1997
WO	WO 99/21316	2/1997
WO	WO 00/72416	11/2000
WO	WO 00/72491	11/2000

OTHER PUBLICATIONS

Patent abstracts of Japan vol. 010, No. 080 (P-441), Mar. 29, 1986 & JP 60 217315, Oct. 30, 1985.

Patent abstracts of Japan vol. 012, No. 280 (P-739), Aug. 2, 1988 & JP 63 060410 Mar. 16, 1988.

Patent abstracts of Japan vol. 011, No. 144 (P-574), May 12 1987 & JP 61 282803, Dec. 13, 1986.

Patent abstracts of Japan vol. 014, No. 189 (P-1037), Apr. 17, 1990 & JP 02 034806 Feb. 5, 1990.

Bernacki, B.E., et al., "Alignment-Insensitive Technique for Wideband Tuning of an Unmodified Semiconductor Laser," *Optics Letters, US, Optical Society of America, Washington*, vol. 13, No. 9, (Sep. 1, 1988), pp. 725-727, XP000710590, ISSN: 0146-9579, figure 1.

Clarke, R.H., "Fields in Extended Cavity Lasers," *IEEE Journal of Quantum Electronics, US, IEEE, Inc., New York*, vol. 24, No. 5, (May 1, 1988), pp. 833-842, XP000706012, ISSN: 0018-9197, figure 1.

(List continued on next page.)

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(57) **ABSTRACT**

An optical network assembly includes a planar lightguide circuit (PLC) and a filtering device. A PLC can have at least two optical paths for propagating optical energy. The PLC can be designed to channel optical energy with its optical paths towards the filtering device in order to separate the optical energy into at least two beams, where a first beam can contain a first information channel and a second beam can contain a second information channel. The filtering device can be attached directly to the PLC or it can be attached directly to an optical waveguide that is also connected to the PLC. The optical waveguide can either feed optical energy to or propagate optical energy away from the PLC. Multiple optical waveguides can be attached to a PLC to feed optical energy into and away from the PLC. The PLC, filtering device, and optical waveguide can form the building blocks to more complex optical network architectures.

34 Claims, 13 Drawing Sheets

